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PREVALENCE OF NASOPHARYNGEAL CARCINOMA PATIENTS IN THE DEPARTMENT OF ORL-HNS HASAN SADIKIN GENERAL HOSPITAL 2010-2017

***Riri Handayani*[1*], *Yussy Afriani Dewi*[1], *Deasy Z Madani*[1]**

[1]*Department of Otorhinolaryngology–Head and Neck Surgery, Faculty of Medicine Padjadjaran University;Hasan Sadikin General Hospital, Bandung, Indonesia*

Abstract

Introduction: Nasopharyngeal Carcinoma starting from Rosenmüller fossa and intracranial or local spread as a mass in the head area. Nasopharyngeal carcinoma is also associated with hearing problems, serous otitis media, tinnitus, nasal congestion, anosmia, nose bleeding, difficulty swallowing, and dysphonia. Nasopharyngeal carcinoma is a disease that spreads globally and divides races around the world. The purpose of this study is to determine the prevalence of nasopharyngeal disease in Otorhinolaringology-Head and Neck Department, Dr. Hasan Sadikin General Hospital Bandung in 2010-2017.
Method: Medical record method description of Nasopharyngeal Carcinoma at Departement of Otorhinolaringology-Head and Neck Surgery, Dr. Hasan Sadikin General Hospital Bandung in 2010-2017 that used sampling method..
Result: There were 1378 patients nasopharyngeal carcinoma, 976 people that included, 657 were men and 319 were women. Obtain most elementary school education (54.9 %) the majority of male patients (67.3 %) with various job background, whereas female patients were housewives (28.1%), and those aged 41-50 years (34%). Most histopathology are undifferentiated carcinoma (58.3 %).
Conclusion: Nasopharyngeal Carcinoma patients at the Otorhinolaringology-Head and Neck Surgery Departement. Dr. Hasan Sadikin General Hospital Bandung are 1378 cases. There was higher instance in middle age, older men and elementary school educated with major histopathology finding was undifferentiated carcinoma.

Article Info

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Corresponding author:
Address: Jl. Pasteur No. 38, Pasteur, Kec. Sukajadi, Kota Bandung, Jawa Barat 40161

e-mail: dr.ririhandayani@gmail.com

1. INTRODUCTION

Nasopharyngeal carcinoma (NPC) is a common malignant tumor in head and neck which developed in the nasopharynx with propensity at Rosenmüller fossa and roof of the nasopharynx [1] .

NPC is a malignancy with variable incidence rate across the world. In some regions, especially the southern parts of China including Hong Kong, parts of Southeast Asia, and the Mediterranean basin, this cancer occurs in an endemic form. In Indonesia NPC is frequent malignant ENT tumor. NPC includes the top five malignant tumors, whereas in the head and neck area occupies the first place with a percentage of almost 60% [1].

Nasopharynx is the highest portion of the pharynx, its a cuboidal midline chamber that expands from the base of the cranium to the level of soft palate.. Anteriorly it opens to the nasal cavity through the paired choanae and posteroinferiorly to the oropharynx. Inside the nasopharyngeal space, the lateral walls are lifted at the terminal edge of the Eustachian tubes, making the torus tubarius. The extension of the mucosal folds of the posteroinferior torus illustrate the impression of the salpingopharyngeus muscle (salpingopharyngeal fold) at the point it down and enters the pharyngeal wall. Behind the eustachian tube ostium, laterally from salpingopharyngeal fold there is a pharyngeal recess (Rosenmüller fossa). The fossa is covered by nasopharyngeal mucosa and is the most well-known site of cause of nasopharyngeal carcinoma (NPC) [2-4].

At present understanding about interaction between EpsteinBarr virus (EBV) infection, genetic factors, and environmental development NPC has not yet been approved, although much research has been done on the etiology of NPC [5]. The different ethnic and geographical distribution of NPC which largely determines genetic vulnerability, plays a major role based on epidemiological studies [6]. NPC consistently linked with Epstein-Barr virus (EBV) characterized by difference incidence between geography and population. In spite of the fact that human genetic susceptibility has been connected to the advancement of NPC, it is clear that distinction in way of life and dietary components, in concert with environmental variables, are likely to extend the chance of creating this cancer and lead to the interesting dissemination of NPC [7].

Nasopharyngeal carcinoma is a major health concern. Typically this cancer is more prevalent in men than women, elderly and low educated. With symptoms of nasal congestion, ears fullness, cranial nerve paralysis, the most often histological type is undifferentiated carcinoma and the most common stadium when patient was diagnosed is stage IV. Stage of NPC was an important point for prognosis. Early-stage cancer patients have a better survival outcomes relative to advanced patients [8,9].

This study was conducted to determine the prevalence of nasopharyngeal carcinoma in the Department of Otorhinolaryngology-Head and Neck Surgery, Dr. Hasan Sadikin General Hospital, Bandung period 2010-2017.

2. MATERIAL AND METHODS

This research was conducted at the Department of Otorhinolaryngology-Head and Neck Surgery, Dr. Hasan Sadikin General Hospital, in January 2018 using comprehensive cross-sectional design. The population was all cancer patients with Nasopharynx treated in the Department of Ear, Nose and Throat Health, Dr. General Hospital. Hasan Sadikin Bandung during 2010-2017 whether hospitalized and/or ambulatory. Medical history document are used as secondary information from research subjects. For collecting samples, a complete sampling system is used.

Samples are all subjects with complete medical record data. The criteria for inclusion are medical records which include all variables analyzed such as age, sex, occupation, education, primary location, histopathology findings, and cancer stage. Exclusion criteria are medical records that have missing or incomplete data from the variables needed in this study. Total of 1.378 medical records, 976 were included because they had all the variables needed.

Nasopharyngeal cancer is selected based on clinical diagnosis, Age grouped into 0-5 years, 5-11 years, 12-16 years, 17-25 years, 26-35 years,

36-45 years, 46-55 years, 56-65 years and > 65 years old. Gender divide into men and women, education is grouped based on uneducated, elementary school, high school and college. Work is grouped based on unemployment, labor, farmers, housewives, government employees, private workers, students, and others. Clinical symptoms in the form of nasal congestion, ear feels full, and cranial nerve paralyse. Depending on 2005 Tumor Classification of World Health Organization, NPC histopathological findings are classified [10]. Staging for NPC based on American Joint Committee on Cancer staging system eight edition was categorized by location and TNM criteria to stage I, II, III and IV [11].

3. RESULT

There were 1378 nasopharyngeal cancer patients in the Department of Otorhinolaryngology-Head and Neck Surgery, Dr. Hasan Sadikin General Hospital, Bandung during the 2010-2017 study period, a total of 1378 patients were included in the medical record due to the completeness of the data and as many as 402 patients were omitted.

3.1 Distribution Table Based on Gender

The highest sex group is men, as many as 265 people (67.3%).

Sex	n=976	%
Male	657	67.3
Female	319	32.7

3.2 Distribution Table Based on Age Groups

The most age group of sufferers is elderly, which is at the age of 41-50 years as many as 332 people (34%).

Age	n	%
41-50	332	34
51-60	264	27
31-40	143	14.7
>60	116	11.9
21-30	59	6
11-20	32	3.3
5-11	15	1.5
Age Median	50	
Age Modus	50	
Age Interval	2-91	

3.3 Distribution Table based on Education level

Based on the level of education, most people who received their last education at elementary school were 371 people (54.9%), then followed by senior high schools as many as 242 people (24.8%) and junior high schools as many as 184 people (18.9%).

Education level	n	%
Elementary School	371	54.9
Senior High School	242	24.8
Junior High School	184	18.9
Uneducated	65	6.7
University	67	6.9

3.4 Distribution Table based on Work

Although most sufferers were male, because the majority of female sufferers were housewives, male sufferers had various occupational backgrounds, then housewives 274 (28.1%).

Work	n	%
Housewives	274	28.1
Labour	185	18.6
Unemployment	157	16.1
Entrepreneur	101	10.3
Private workers	81	8.3
Farmer	67	6.9
Government workers	41	4.2
Students	34	3.5
Others	21	2.2
Retired	15	1.5

3.5 Distribution Table Based on Main Complaint

Based on the main complaint, the most often felt by the sufferer is lump at the neck (54.5%)

Main Complain	n=976	%
Lump at neck	532	54.5
Stuffy nose	254	26
Ear fullness	125	12.8
Cranial nerve paralysis	45	4.61
Epistaxis	20	2.1

3.6 Distribution Table based on Histopathology

Based on the most histopathological features, is undifferentiated carcinoma with 569 patients (58.3%), 148 patients (22.3%) had a picture of squamous cell carcinoma.

Histopatology	n	%
Undifferentiated carcinoma	569	58.3
Keratinizing squamous cell carcinoma	215	20
Non keratinizing squamous cell carcinoma	192	19.7

3.7 Distribution Table based on the NPC stage

Based on the stage, most patients come at an advanced stage, stage IV (54.7%)

Stage	n=976	%
IV	534	54.7
III	254	26.2
II	182	18.6
I	6	0.6

3.8 Distribution Table based on Therapy

People with NPC usually come with stage IV, so the most common therapy is chemoradiation (87.5%).

Therapy	n	%
Radiotherapy	122	12.5
Chemoradiation	854	87.5

4. DISCUSSION

NPC is a malignant tumor in head and neck, originating from nasopharyngeal epithelial cells, Rosenmüller fossa was decisived to be the foremost common location of root of nasopharyngeal carcinoma (NPC) [4]. The disease is 100% associated with infection of Epstein-Barr virus (EBV), especially the most common undifferentiated form of NPC (WHO type III). Almost all NPC cases are genetically positive for EBV, however NPC oncogenesis is not just a result of infection with EBV alone. More than 95% of adults across the globe are stable EBV carriers in all ethnic groups. The transformation of EBV infection into a malignant disease is likely due to viral reactivation in conjunction with other (epi) genetic events, including the production of (multiple) cellular genetic lesions due to environmental carcinogens, food components, possibly associated with genetic immunodeficiencies [12,13].

In Indonesia, which has an ethnically diverse population of 225 million people, NPC is prevalent among different indigenous peoples and poses a major socio-economic problem with an approximate overall incidence of 6.2/100 000 or about 12 000 new cases per year with the highest incidence in the 4-5 decade with a higher proportion of men than women (62.2%) [12]. Of the 36.261 patients in the Otorhinolaryngology Department-Head and Neck Surgery, Dr. Hasan Sadikin General Hospital, Bandung, there were 1.378 patients with Nasopharyngeal Carcinoma in the period 2010-2017.

Because NPC is associated with multiple etiological factors, the pathogenic mechanism still needs clarification. EBV infection is thought to play a key role in the incidence of NPC, but lifestyle, poor diet and genetic factors are also affected. Tobacco smoking has long been recognized as one of NPC's major risk factors for the climate. The risk of developing NPC for smokers was approximately 1.6 times the risk for non-smokers, with an apparent dose-dependent relationship, according to meta-analysis studies, correlations were greater in low-risk populations. Frequent ingestion of salt-preserved foods was considered a risk factor for the development of NPC, as the N-nitrosamines in them are a form of carcinogenic substance. Alcohol and Chinese herbal medicine are other environmental factors linked with the growth of NPC [12,13].

Many NPC patients are not highly educated, 371 patients are primary school graduates (54.9%); 242 patients are secondary school graduates (24.8%). This shows that low-education patients can lack of NPC knowledge.

Low-educated people tend to have lower socioeconomic condition that can influence their way of life. Significant associations between elevated NPC risk with low socioeconomic status has been studied [14,15].

A majority of patients as many as 569 (58.3%) were categorized as undifferentiated carcinoma from histological findings and 215 (20%) are classified as squamous cell carcinoma. NPC is classified histopathologically into three groups according to the WHO classification: keratinizing squamous cell carcinoma (WHO type I), nonkeratinizing squamous cell carcinoma (WHO type II), and undifferentiated carcinoma (WHO type III). Type III NPC WHO is the most prevalent type of NPC in Southeast Asia and other high-incidence regions, and is most closely related to EBV. Persons from endemic areas are thought to be more genetically susceptible to the disease with several human leukocyte antigens (HLA) haplotypes associated with the disease (e.g., HLAA2, AW19, BW46 and B17). Certain genetic susceptibilities have been postulated, such as cytochrome P450 mutations concerning nitrosamine metabolism. These hypotheses may be plausible as salted fish and other preserved foods are considered disease risk factors for the climate. It should be noted that while EBV is necessary to develop most of the nasopharynx's non-keratinizing Squamous Cell Carcinoma (SCC), viral infection is insufficient in itself to induce malignancy. In developing keratinizing SCC, EBV plays much less a role, especially in areas where malignancy is not considered endemic. At other sites within the upper aerodigestive tract, keratinizing SCC appears to be related to smoking, close to keratinizing SCC. Keratinizing SCC is more likely to be locally advanced and less likely to be metastatic to locoregional lymph nodes than non-keratinizing SCC. Type II/III NPC WHO is an endemic neoplasm such as in southern China and type I NPC WHO is more common in non-endemic areas [5,10,16].

Clinical presentation of NPC is associated with the extent of primary and nodal disease. Possible primary tumor invasion routes are anteriorly distributed into the nasal cavity, pterygoid fossa, and maxillary sinuses; lateral involvement in parapharyngeal and infratemporal spaces beyond the pharyngobasilar fascia; and base of brain, clivus, and intracranial structures when the disease spreads posteriorly and superiorly. Therefore, depending on the affected anatomical structures, clinical appearance differs accordingly, ranging from non-specific epistaxis symptoms, unilateral nasal obstruction, and auditory complaints to cranial nerve palsies (third, fourth, fifth, sixth, and twelfth are most damaged nerves). Nodal neck metastasis is a typical clinical finding in nasopharyngeal carcinoma [11].

At late stage (stage III and IV), most patients are first diagnosed. High percentage of patients with cancer which diagnosed at late stage indicates hardship in achieve early diagnosis. This may be due to a paucity of patient awareness of NPC, the symptoms are not specific., and hospital charge are too costly, and they prefer alternative medicine rather than going to medical facilities. Other than that, the screening tools like EBV-related serologic tests in high-risk populations not yet available in daily clinics [17,18].

The limitations of this analysis were inadequate or lost information , as well as input data collect only from one hospital. This can be described as an iceberg phenomenon considering it is not from all population, and can only be identify from patients expense to Hasan Sadikin General Hospital. Certain variables such as location, gender, clinical finding, treatment, and history of smoking can be further researched or risk factors associated with nasopharyngeal cancer can be related and assessing quality of life [19].

5. CONCLUSION

In conclusion, nasopharyngeal cancer is more common in men. Dominated by middle age (46-55 years) and more. Most nasopharyngeal cancers are found in population with low educational levels, especially elementary and socioeconomic condition below standard. Nasopharyngeal carcinoma is already present at an advanced stage in most cases. Undifferentiated carsinoma has been found in most histopathological result.

Nasopharyngeal cancer can affect people from different backgrounds; to reduce prevalence of nasopharyngeal cancer, awareness and prevention is required in society. It is recommended that patients with high prevalence tendency, be detected early by publicize the results of this study to first-line health employee and by training them to identify disease early, in order to provide patients with sufficient early treatment, disability limitations and other precaution. Often patients come with an advanced stage, palliative care is also required to enhance the quality of life in addition to treatment preference.

REFERENCE

[1] Vinay Kumar M AKA, Nelson Fausto, Jon C. Aster, . Robbins and Cotran Pathologic Basis of Disease. Edisi ke-Eighth. Philadelphia: Saunders; 2010.

[2] Gu M, McGrath C, Hagg E, Wong R, Yang Y. Anatomy of the upper airway and its growth in childhood. Journal of Dentistry and Oral Biology. 2016.

[3] Brown JJ, Fee Jr WE. Surgical resection of the nasopharynx. Operative Techniques in Otolaryngology-Head and Neck Surgery. 2010;21(1):26-34.

[4] Amene C, Cosetti M, Ambekar S, Guthikonda B, Nanda A. Johann christian rosenmüller (1771-1820): A historical perspective on the man behind the fossa. Journal of Neurological Surgery Part B: Skull Base. 2013;74(04):187-93.

[5] Cao S-M, Simons MJ, Qian C-N. The prevalence and prevention of nasopharyngeal carcinoma in China. Chinese journal of cancer. 2011;30(2):114.

[6] Tsao SW, Yip YL, Tsang CM, Pang PS, Lau VMY, Zhang G, et al. Etiological factors of nasopharyngeal carcinoma. Oral oncology. 2014;50(5):330-8.

[7] Fang C-Y, Huang S-Y, Wu C-C, Hsu H-Y, Chou S-P, Tsai C-H, et al. The synergistic effect of chemical carcinogens enhances Epstein-Barr virus reactivation and tumor progression of nasopharyngeal carcinoma cells. PloS one. 2012;7(9).

[8] King T, Agulnik M. Head and neck cancer: changing epidemiology and public health implications. Head & Neck. 2010;24(10).

[9] El-Sherbieny E, Rashwan H, Lubis SH, Choi VJ. Prognostic factors in patients with nasopharyngeal carcinoma treated in Hospital Kuala Lumpur. Asian Pac J Cancer Prev. 2011;12(7):1739-43.

[10] Stelow EB, Wenig BM. Update from the 4th edition of the World Health Organization classification of head and neck tumours: nasopharynx. Head and neck pathology. 2017;11(1):16-22.

[11] Chua MLK, Wee JTS, Hui EP, Chan ATC. Nasopharyngeal carcinoma. The Lancet. 2016;387(10022):1012-24.

[12] Adham M, Kurniawan AN, Muhtadi AI, Roezin A, Hermani B, Gondhowiardjo S, et al. Nasopharyngeal carcinoma in Indonesia: epidemiology, incidence, signs, and symptoms at presentation. Chinese journal of cancer. 2012;31(4):185.

[13] Tang L-L, Chen W-Q, Xue W-Q, He Y-Q, Zheng R-S, Zeng Y-X, et al. Global trends in incidence and mortality of nasopharyngeal carcinoma. Cancer letters. 2016;374(1):22-30.

[14] Liu Z, Chang ET, Liu Q, Cai Y, Zhang Z, Chen G, et al. Quantification of familial risk of nasopharyngeal carcinoma in a high‐incidence area. Cancer. 2017;123(14):2716-25.

[15] Turkoz FP, Celenkoglu G, Dogu GG, Kalender ME, Coskun U, Alkis N, et al. Risk factors of nasopharyngeal carcinoma in Turkey-an epidemiological survey of the Anatolian Society of Medical Oncology. Asian Pac J Cancer Prev. 2011;12(11):3017-21.

[16] Rosales-Pérez S, Cano-Valdez AM, Flores-Balcázar CH, Guedea-Edo F, Lino-Silva LS, Lozano-Borbalas A, et al. Expression of Epstein-Barr virus-encoded latent membrane protein (LMP-1), p16 and p53 proteins in nonendemic nasopharyngeal carcinoma (NPC): a clinicopathological study. Archives of medical research. 2014;45(3):229-36.

[17] [17] Zhang L, Chen Q-Y, Liu H, Tang L-Q, Mai H-Q. Emerging treatment options for nasopharyngeal carcinoma. Drug design, development and therapy. 2013;7:37.

[18] Tabuchi K, Nakayama M, Nishimura B, Hayashi K, Hara A. Early detection of nasopharyngeal carcinoma. International journal of otolaryngology. 2011;2011.

[19] Tulalamba W JT. Review Article: Nasopharyngeal Carcinoma Signaling Pathway: An Update on Molecular Biomarkers International. Journal of Cell Biology 2012;2012.